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ABSTRACT

This guide to Indiana's academic standards in English/Language Arts, Mathematics, Science, and the Social Studies for Grade 6 students begins with a note to students and another note to parents. The guide spells out what students should know and be able to do in each subject, at each grade level. The guide also lists 10 things parents can do to help students succeed and includes information on assessments or measures of student learning. It cites the following seven standards for English/Language Arts: (1) Reading: Word Recognition, Fluency, and Vocabulary Development; (2) Reading: Comprehension (Focus on Informational Materials); (3) Reading: Literary Response and Analysis; (4) Writing: Process; (5) Writing: Applications (Different Types of Writing and Their Applications); (6) Writing: English Language Conventions; and (7) Listening and Speaking: Skills, Strategies, and Applications. The guide lists these seven standards for Mathematics: Number Sense, Computation, Algebra and Functions, Geometry, Measurement, Data Analysis and Probability, and Problem Solving. It enumerates the following seven standards for Science: Nature of Science and Technology, Scientific Thinking, Physical Setting, Living Environment, Mathematical World, Historical Perspectives, and Common Themes. The guide lists these five standards for the Social Studies: History; Civics and Government; Geography; Economics; and Individuals, Society, and Culture. Attached are sheets for notes. (NKA)

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ED 477 625

Grade 6

Indiana's Academic Standards

English/Language Arts
Mathematics
Science
Social Studies

Adopted by the
Indiana State
Board of Education
2000 – 2001

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Dear Student,

The world is changing fast. In order for you to succeed in school, at work, and in the community, you will need more skills and knowledge than ever before.

Getting in shape academically is the single most important thing you can do to prepare for a successful future.

This booklet of Academic Standards clearly spells out what you should know and be able to do in each subject, at your grade level. Examples are given to help you understand what is required to meet the Standards. **Please review this guide with your teachers and share it with your parents and family.**

Whether you go on to be a surgeon, computer technician, teacher, or airplane mechanic, learning never stops. There will always be a more demanding computer application, a new invention, or a more complex project awaiting you.

To be ready for tomorrow — get in top academic shape today. Use this guide year round to check your progress.

Dear Parent,

The demand is greater than ever for people who can read, write, speak effectively, analyze problems and set priorities, learn new things quickly, take initiative, and work in teams. Technology has already transported us into a time where the next e-commerce opportunity is limited only by our imagination.

That's why Indiana has established new Academic Standards in English/language arts, mathematics, science, and social studies. These world-class Standards outline what your student should know and be able to do in each subject, at each grade level.

Indiana's new Academic Standards were recommended by Indiana's Education Roundtable and adopted by the State Board of Education. According to Achieve, Inc. and other respected education experts, these Standards are among the best in the nation.

Higher academic standards pose a challenge, but Indiana students have shown that they can measure up. Our students know that higher expectations lead to greater rewards — and they're prepared to work harder. We know that by setting specific goals, everyone wins. Teachers have clear targets, students know what's expected, and you have detailed information about your child's strengths and weaknesses.

How can you be sure that your student will be ready to meet these challenges? First, keep in mind that learning does not take place only in the classroom. Students spend far more time at home than they do in school. How they spend their time can make a real difference. That is where your help is the most important.

On the next page is a list of 10 things you can do to help your student get a good education. **Nothing will have a bigger impact on your student's success than your involvement in his or her education.** We hope you use this guide as a tool to help your child succeed today and in the future.

Sincerely,

Governor Frank O'Bannon

Dr. Suellen Reed,
Superintendent of Public Instruction

Stan Jones,
Commissioner for Higher Education

10 things parents can do to help students succeed

1. **Build relationships with your child's teachers.** Find out what each teacher expects of your child and how you can help your child prepare to meet those expectations.

2. **Read.** Reading is the foundation for all learning. Read to your young child, encourage your older child to read to you, or spend time together as a family reading. All this helps your child develop strong reading habits and skills from the beginning and reinforces these habits and skills as your child grows. Reading is one of the most important contributions you can make to your child's education.

3. **Practice writing at home.** Letters, journal entries, e-mail messages, and grocery lists are all writing opportunities. Show that writing is an effective form of communication and that you write for a variety of purposes.

4. **Make math part of everyday life.** Cooking, gardening, paying bills, and even shopping are all good ways to help your child understand and use mathematics skills. Show that there may be many ways to get to the right answer and encourage your child to explain his or her method.

5. **Ask your child to explain his or her thinking.** Ask lots of "why" questions. Children should be able to explain their reasoning, how they came up with the right answer, and why they chose one answer over another.

6. **Expect that homework will be done.** Keep track of your child's homework assignments and regularly look at his or her completed work. Some teachers now give parents a number to call for a recorded message of that day's homework assignments; others put the information on the Internet. If your school doesn't offer these features, talk to the teacher about how you can get this important information. Even if there aren't specific assignments, find out how you can stay informed about what your child is working on so that you can help at home.

7. **Use the community as a classroom.** Feed your child's curiosity about the world 365 days a year. Use the library to learn more about the history of your town. A visit to a farmer's market can help your child picture our state's rich agricultural tradition. Take your young child to zoos and parks and your older child to museums and workplaces to show how learning connects to the real world.

8. **Encourage group study.** Open your home to your child's friends for informal study sessions. Promote outside formal study groups through church or school organizations or other groups. Study groups will be especially important as your child becomes older and more independent. The study habits your child learns now will carry over into college and beyond.

9. **Help other parents understand academic expectations.** Use your school and employee newsletters, athletic associations, booster clubs, a PTA or PTO meeting, or just a casual conversation to help other parents understand what academic standards mean for them, their children, and their school and how they can help their children learn at home.

10. **Spend time at school.** The best way to know what goes on in your child's school is to spend time there. If you're a working parent, this isn't easy, and you may not be able to do it very often. But "once in awhile" is better than "never."

Remember: *You are the most important influence on your child. Indiana's Academic Standards give you an important tool to ensure that your child gets the best education possible.*

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Measuring Student Learning

Children develop at different rates. Some take longer and need more help to learn certain skills. Assessments, like ISTEP+, help teachers understand how students are progressing and assist in identifying academic areas where students may need additional attention.

Assessments also provide a measure of school accountability – assisting schools in their efforts to align curriculum and instruction with the state's Academic Standards and reporting progress to parents and the public. Students in designated grades take ISTEP+ in the fall of each school year – with the assessment based on what the child should have learned and retained from the previous year.

Core 40 End-of-Course Assessments are given at the end of specific high school classes and are a cumulative assessment of what students should have learned during that course. End-of-Course Assessments also provide a means to ensure the quality and rigor of high school courses across the state. Voluntary for schools at this time, a selection of these assessments will be phased in over the next five years.

◗ Indicates mandatory ISTEP+ testing ♦ Indicates voluntary assessments

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
	♦Reading	♦Reading	◗ English/Lang. Arts ◗ Mathematics	

What's the Goal? By Grade 4, have students moved beyond learning to read toward "reading to learn" other subjects? Can each student write a short, organized essay? Can each student use math skills to solve everyday, real-world problems?

Grade 5	Grade 6	Grade 7	Grade 8
◗ Science (begins 2003) ◗ Social Studies (begins 2004)	◗ English/Lang. Arts ◗ Mathematics	◗ Science (begins 2005) ◗ Social Studies (begins 2006)	◗ English/Lang. Arts ◗ Mathematics

What's the Goal? By Grades 7 and 8, have students developed strong enough study habits in English and math skills to be ready for high school?

Grade 9	Grade 10 (GQE)	Grade 11	Grade 12	Graduation
◗ Science (begins 2007) ◗ Social Studies (begins 2008)	◗ English/Lang. Arts ◗ Mathematics	(two re-tests available for those who have not passed the GQE)	(two re-tests available for those who have not passed the GQE)	(or continued extra help)
♦Core 40 End-of-Course Assessments	♦Core 40 End-of-Course Assessments	♦Core 40 End-of-Course Assessments	♦Core 40 End-of-Course Assessments	

What's the Goal?
By Grade 12, can students read well enough to pass a driver's exam, understand an appliance manual, or compare two opposing newspaper editorials? Could students write an effective job application letter? By testing skills like these in Grade 10, teachers know whether – and in which skill area – students need more attention before it's time to graduate.

For more information visit www.doe.state.in.us/standards and click on Assessment or call 1-800-54-ISTEP (1-888-544-7837).

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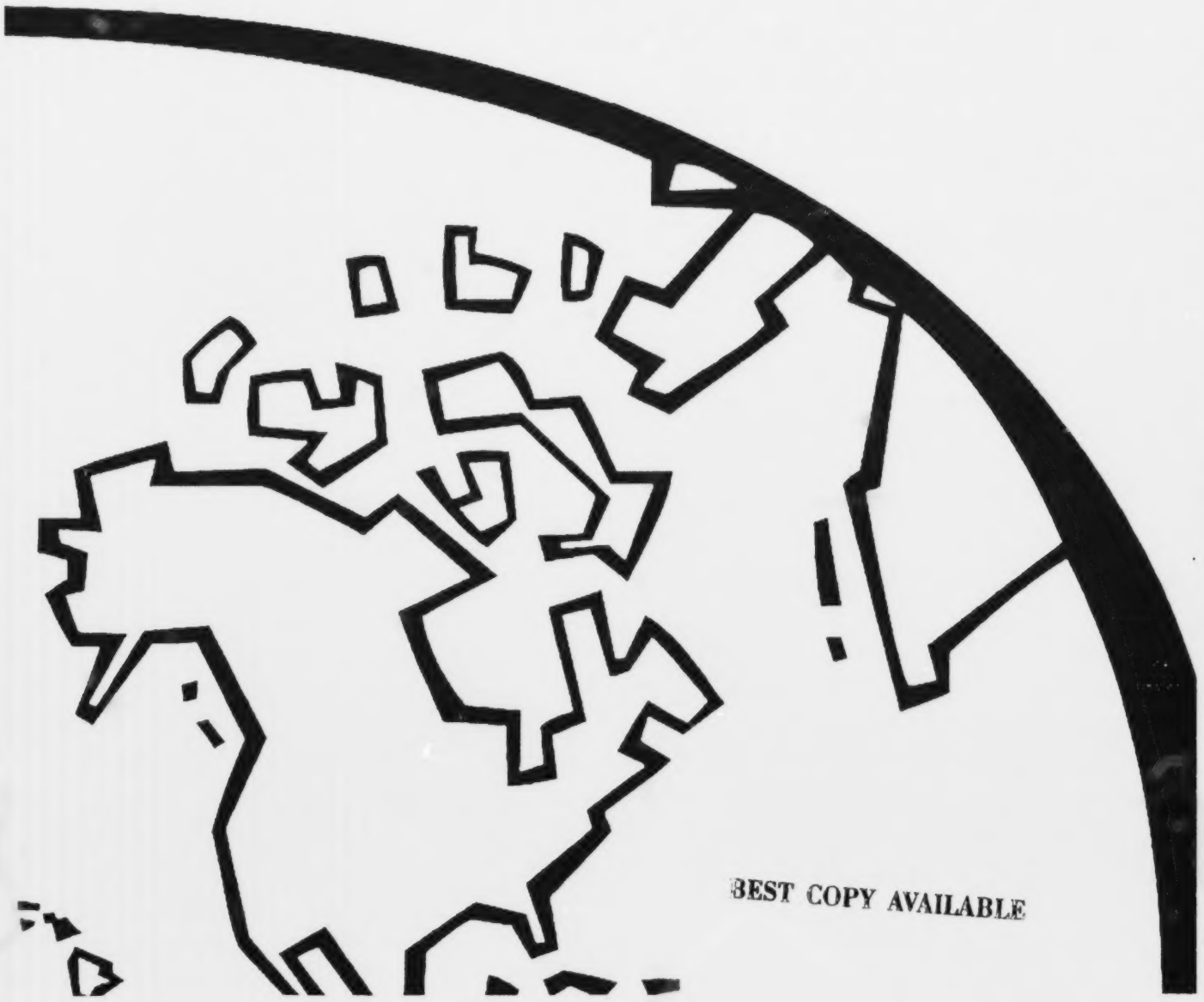
Grade 6

English/Language Arts



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Standard 1

READING: Word Recognition, Fluency, and Vocabulary Development

Students use their knowledge of word parts and word relationships, as well as context clues (the meaning of the text around a word), to determine the meaning of specialized vocabulary and to understand the precise meaning of grade-level-appropriate words.

Decoding and Word Recognition

6.1.1 Read aloud grade-level-appropriate poems, narrative text (stories), and expository text (information) fluently and accurately and with appropriate timing, changes in voice, and expression.

Vocabulary and Concept Development

6.1.2 Identify and interpret figurative language (including similes, comparisons that use *like* or *as*, and metaphors, implied comparisons) and words with multiple meanings.

Example: Understand the different meanings of the word *primary* when used in sentences, such as the following: *Tom is a student at the local primary school. Betsy's mother decided to run for a seat on the city council but lost in the primary election.* Understand descriptive metaphors, such as *The city lay under a blanket of fog.*

6.1.3 Recognize the origins and meanings of frequently used foreign words in English and use these words accurately in speaking and writing.

Example: Understand foreign words that are often used in English, such as *enchilada* (Spanish), *lasagna* (Italian), and *delicatessen* (German).

6.1.4 Understand unknown words in informational texts by using word, sentence, and paragraph clues to determine meaning.

6.1.5 Understand and explain slight differences in meaning in related words.

Example: Explain the difference when someone is described as speaking *softly* and when someone is described as speaking *quietly*.

Standard 2

READING: Comprehension

(Focus on Informational Materials)

Students read and understand grade-level-appropriate material. They describe and connect the essential ideas, arguments, and perspectives of the text by using their knowledge of text structure, organization, and purpose. The selections in the **Indiana Reading List** *(available online at www.doe.state.in.us/standards/readinglist.html) illustrate the quality and complexity of the materials to be read by students. At Grade 6, in addition to regular classroom reading, students read a variety of grade-level-appropriate narrative (story) and expository (informational and technical) texts, including classic and contemporary literature, poetry, magazines, newspapers, reference materials, and online information.*

Structural Features of Informational and Technical Materials

6.2.1 Identify the structural features of popular media (newspapers, magazines, online information) and use the features to obtain information.

Example: Do a keyword search on the Internet to find information for a research report. Use the section headers for a newspaper to locate information for a report on current world events.

6.2.2 Analyze text that uses a compare-and-contrast organizational pattern.

Example: Read a section in an English textbook that describes the difference between similes and metaphors. Evaluate how well the organization of the text serves the reader's comprehension.

Comprehension and Analysis of Grade-Level-Appropriate Text

6.2.3 Connect and clarify main ideas by identifying their relationships to multiple sources and related topics.

Example: Read about another culture in a magazine such as *Cricket* or *National Geographic*. Then, compare what was learned to descriptions of other peoples and cultures in other reading sources.

6.2.4 Clarify an understanding of texts by creating outlines, notes, diagrams, summaries, or reports.

Example: Take notes while reading to create an outline or graphic organizer, such as a concept map, flow chart, or diagram, of the main ideas and supporting details from what is read. Read an informational book and summarize the main ideas.

6.2.5 Follow multiple-step instructions for preparing applications.

Example: Follow directions to fill out an application for a public library card, a bank savings account, or a membership to a boys' or girls' club, soccer league, YMCA or YWCA, or another extra-curricular organization.

Expository (Informational) Critique

6.2.6 Determine the adequacy and appropriateness of the evidence presented for an author's conclusions and evaluate whether the author adequately supports inferences.

Example: In reading *Amelia Earhart: Courage in the Sky* by Mona Kerby, note the author's opinions and conclusions. Decide if they are adequately supported by the facts that she presents.

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6.2.7 Make reasonable statements and conclusions about a text, supporting them with accurate examples.

Example: Read some of the 28 poems in Lee Bennett Hopkins' *Been to Yesterdays: Poems of Life*, and draw conclusions about what the poet is saying about his experiences in the middle school years. Describe Leonardo da Vinci's greatest achievements, after reading *Leonardo da Vinci: Artist, Inventor, and Scientist of the Renaissance* by Francesca Romei.

6.2.8 Note instances of persuasion, propaganda, and faulty reasoning in text.

Example: After reading an article by one author on the reasons for repopulating western national parks with wolves and another article by a different author reporting ranchers' opposition to the program, describe the ways each author tries to persuade the reader.

Standard 3

READING: Literary Response and Analysis

Students read and respond to grade-level-appropriate historically or culturally significant works of literature that reflect and enhance their study of history and social science. They clarify the ideas and connect them to other literary works. The selections in the **Indiana Reading List** *(available online at www.doe.state.in.us/standards/readinglist.html) illustrate the quality and complexity of the materials to be read by students.*

Structural Features of Literature

6.3.1 Identify different types (genres) of fiction and describe the major characteristics of each form.

Example: Describe the common characteristics of different types of fiction, such as folklore, mystery, science fiction, adventure, fantasy, or biography, and provide examples of each type from books read by students in the class. Use a graphic organizer to show comparisons.

Narrative Analysis of Grade-Level-Appropriate Text

6.3.2 Analyze the effect of the qualities of the character on the plot and the resolution of the conflict.

Example: After reading the story *Dragonwings* by Laurence Yep, describe how the boy's courage and loyalty to his father help him to realize his father's dreams of making a flying machine.

6.3.3 Analyze the influence of the setting on the problem and its resolution.

Example: Recognize the influence of the settings in a book, such as the role of the North and South in the book *The Watsons Go to Birmingham — 1963* by Christopher Paul Curtis, in which an African-American family from Michigan goes to visit relatives in Alabama in the summer of 1963.

6.3.4 Define how tone and meaning are conveyed in poetry through word choice, figurative language, sentence structure, line length, punctuation, rhythm, alliteration (repetition of sounds, such as *wild and woolly* or *threatening throngs*), and rhyme.

Example: Describe the features of a poem, such as "Mother to Son" by Langston Hughes, which illustrates many of the characteristics of poetry: sound, rhythm, repetition, and metaphorical language.

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6.3.5 Identify the speaker and recognize the difference between first-person (the narrator tells the story from the "I" perspective) and third-person (the narrator tells the story from an outside perspective) narration.

Example: Read an autobiography, such as *Michael Jordan: My Story*, and compare it to a biography on the same person, such as *Michael Jordan* by Richard Rambeck. Tell how the life story of the person is shown in different ways when told in the first-person or third-person narration.

6.3.6 Identify and analyze features of themes conveyed through characters, actions, and images.

Example: Analyze the way a theme is developed throughout a book, such as the themes of prejudice and criticism of others shown throughout the events and characters in *Summer of My German Soldier* by Bette Greene.

6.3.7 Explain the effects of common literary devices, such as symbolism, imagery, or metaphor, in a variety of fictional and nonfictional texts.

- Symbolism: the use of an object to represent something else; for example, a dove might symbolize peace
- Imagery: the use of language to create vivid pictures in the reader's mind
- Metaphor: an implied comparison in which a word or phrase is used in place of another, such as *He was drowning in money*

Example: Select a variety of examples of sportswriting from a local or national newspaper. Explain the use of metaphors and symbolism throughout sportswriting.

Literary Criticism

6.3.8 Critique the believability of characters and the degree to which a plot is believable or realistic.

Example: Read myths, such as *Hercules* or *Jason and the Argonauts*, and discuss the believability of the characters and plots as compared to realistic fiction.

Standard 4

WRITING: Process

Students discuss and keep a list of writing ideas and use graphic organizers to plan writing. They write clear, coherent, and focused essays. Students progress through the stages of the writing process and proofread, edit, and revise writing.

Organization and Focus

6.4.1 Discuss ideas for writing, keep a list or notebook of ideas, and use graphic organizers to plan writing.

6.4.2 Choose the form of writing that best suits the intended purpose.

6.4.3 Write informational pieces of several paragraphs that:

- engage the interest of the reader.
- state a clear purpose.
- develop the topic with supporting details and precise language.
- conclude with a detailed summary linked to the purpose of the composition.

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6.4.4 Use a variety of effective organizational patterns, including comparison and contrast, organization by categories, and arrangement by order of importance or climactic order.

Research and Technology

6.4.5 Use note-taking skills.

6.4.6 Use organizational features of electronic text (on computers), such as bulletin boards, databases, keyword searches, and e-mail addresses, to locate information.

6.4.7 Use a computer to compose documents with appropriate formatting by using word-processing skills and principles of design, including margins, tabs, spacing, columns, and page orientation.

Evaluation and Revision

6.4.8 Review, evaluate, and revise writing for meaning and clarity.

6.4.9 Edit and proofread one's own writing, as well as that of others, using an editing checklist or set of rules, with specific examples of corrections of frequent errors.

6.4.10 Revise writing to improve the organization and consistency of ideas within and between paragraphs.

Standard 5

WRITING: Applications

(Different Types of Writing and Their Characteristics)

At Grade 6, students write narrative (story), expository (informational), persuasive, and descriptive texts of at least 500 to 700 words. Student writing demonstrates a command of Standard English and the research, organizational, and drafting strategies outlined in Standard 4 — Writing Process. Writing demonstrates an awareness of the audience (intended reader) and purpose for writing.

In addition to producing the different writing forms introduced in earlier grades, such as letters, Grade 6 students use the writing strategies outlined in Standard 4 — Writing Process to:

6.5.1 Write narratives that:

- establish and develop a plot and setting and present a point of view that is appropriate to the stories.
- include sensory details and clear language to develop plot and character.
- use a range of narrative devices, such as dialogue or suspense.

Example: Write a short play that could be presented to the class. Rewrite a short story that was read in class, telling the story from another point of view.

6.5.2 Write descriptions, explanations, comparison and contrast papers, and problem and solution essays that:
- state the thesis (position on the topic) or purpose.
- explain the situation.
- organize the composition clearly.
- offer evidence to support arguments and conclusions.

Example: Write successive drafts of a one- or two-page newspaper article about summer sports camps, including details to support the main topic and allow the reader to compare and contrast the different camps described.

6.5.3 Write research reports that:
- pose relevant questions that can be answered in the report.
- support the main idea or ideas with facts, details, examples, and explanations from multiple authoritative sources, such as speakers, newspapers and magazines, reference books, and online information searches.
- include a bibliography.

Example: Write a research report on George Washington, explaining what Washington accomplished during his presidency and why he is such a significant figure in American history. Write a research report on Native American groups that lived in Indiana and the surrounding states. Include information on whether descendents of these groups still live in the area.

6.5.4 Write responses to literature that:
- develop an interpretation that shows careful reading, understanding, and insight.
- organize the interpretation around several clear ideas.
- develop and justify the interpretation through the use of examples and evidence from the text.

Example: After reading some Grimm fairy tales and folktales from other countries, such as Japan, Russia, India, and the United States, write a response to the stories. Identify the beliefs and values that are highlighted in each of these folktales and develop a theory to explain why similar tales appear in many different cultures.

6.5.5 Write persuasive compositions that:
- state a clear position on a proposition or proposal.
- support the position with organized and relevant evidence and effective emotional appeals.
- anticipate and address reader concerns and counter-arguments.

Example: Write a persuasive essay on how the class should celebrate the end of the school year, including adequate reasons for why the class should participate in the activity described. Create an advertisement for a product to try to convince readers to buy the product.

6.5.6 Use varied word choices to make writing interesting.

Example: Write stories, reports, and letters showing a variety of word choices. (Use *delicious* instead of *good*; *overcoat* or *parka* instead of *coat*.)

6.5.7 Write for different purposes and to a specific audience or person, adjusting tone and style as necessary.

Example: Write a review of a favorite book or film for a classroom writers' workshop. Use clear organization and careful word choices to help the readers of the review decide if they might be interested in reading the book or viewing the film.

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Standard 6

WRITING: English Language Conventions

Students write using Standard English conventions appropriate to this grade level.

Sentence Structure

6.6.1 Use simple, compound, and complex sentences; use effective coordination and subordination of ideas, including both main ideas and supporting ideas in single sentences, to express complete thoughts.

- Simple sentence: sentences with one subject and verb, such as *The pine tree is native to many parts of America.*
- Compound sentence: sentences with two equal clauses, such as *The giraffe has a long neck and long legs, but it is a very graceful animal.*
- Complex sentence: sentences that include one main clause and at least one subordinate clause, such as *I just sat at my desk, not knowing what to do next, although others around me were writing furiously.*

Grammar

6.6.2 Identify and properly use indefinite pronouns (*all, another, both, each, either, few, many, none, one, other, several, some*), present perfect (*have been, has been*), past perfect (*had been*), and future perfect verb tenses (*shall have been*); ensure that verbs agree with compound subjects.

- Indefinite pronouns: *Each should do his or her work.*
- Indefinite pronouns: *Many were absent today.*
- Correct verb agreement: *Todd and Amanda were chosen to star in the play.*
- Incorrect verb agreement: *Todd and Amanda was chosen to star in the play.*

Punctuation

6.6.3 Use colons after the salutation (greeting) in business letters (*Dear Sir:*), semicolons to connect main clauses (*The girl went to school; her brother stayed home.*), and commas before the conjunction in compound sentences (*We worked all day, but we didn't complete the project.*).

Capitalization

6.6.4 Use correct capitalization.

Spelling

6.6.5 Spell correctly frequently misspelled words (*their/they're/there, loose/lose/loss, choose/chose, through/threw*).

Standard 7

LISTENING AND SPEAKING: Skills, Strategies, and Applications

Students deliver focused, coherent presentations that convey ideas clearly and relate to the background and interests of the audience. They evaluate the content of oral communication. Students deliver well-organized formal presentations using traditional speech strategies, including narration, exposition, persuasion, and description. Students use the same Standard English conventions for oral speech that they use in their writing.

Comprehension

6.7.1 Relate the speaker's verbal communication (such as word choice, pitch, feeling, and tone) to the nonverbal message (such as posture and gesture).

6.7.2 Identify the tone, mood, and emotion conveyed in the oral communication.

6.7.3 Restate and carry out multiple-step oral instructions and directions.

Organization and Delivery of Oral Communication

6.7.4 Select a focus, an organizational structure, and a point of view, matching the purpose, message, and vocal modulation (changes in tone) to the audience.

6.7.5 Emphasize important points to assist the listener in following the main ideas and concepts.

6.7.6 Support opinions with researched, documented evidence and with visual or media displays that use appropriate technology.

6.7.7 Use effective timing, volume, tone, and alignment of hand and body gestures to sustain audience interest and attention.

Analysis and Evaluation of Oral and Media Communications

6.7.8 Analyze the use of rhetorical devices, including rhythm and timing of speech, repetitive patterns, and the use of onomatopoeia (naming something by using a sound associated with it, such as *hiss* or *buzz*), for intent and effect.

6.7.9 Identify persuasive and propaganda techniques used in electronic media (television, radio, online sources) and identify false and misleading information.

Speaking Applications

6.7.10 Deliver narrative (story) presentations that:
- establish a context, plot, and point of view.
- include sensory details and specific language to develop the plot and character.
- use a range of narrative (story) devices, including dialogue, tension, or suspense.

6.7.11 Deliver informative presentations that:
- pose relevant questions sufficiently limited in scope to be completely and thoroughly answered.
- develop the topic with facts, details, examples, and explanations from multiple authoritative sources, including speakers, periodicals, and online information.

6.7.12 Deliver oral responses to literature that:
- develop an interpretation that shows careful reading, understanding, and insight.
- organize the presentation around several clear ideas, premises, or images.
- develop and justify the interpretation through the use of examples from the text.

6.7.13 Deliver persuasive presentations that:
- provide a clear statement of the position.
- include relevant evidence.
- offer a logical sequence of information.
- engage the listener and try to gain acceptance of the proposition or proposal.

6.7.14 Deliver presentations on problems and solutions that:
- theorize on the causes and effects of each problem.
- establish connections between the defined problem and at least one solution.
- offer persuasive evidence to support the definition of the problem and the proposed solutions.

Grade 6

Mathematics

In this technological age, mathematics is more important than ever. When students leave school, they are more and more likely to use mathematics in their work and everyday lives — operating computer equipment, planning timelines and schedules, reading and interpreting data, comparing prices, managing personal finances, and completing other problem-solving tasks. What they learn in mathematics and how they learn it will provide an excellent preparation for a challenging and ever-changing future.

The state of Indiana has established the following mathematics Standards to make clear to teachers, students, and parents what knowledge, understanding, and skills students should acquire in Grade 6:

Standard 1 — Number Sense

Understanding the number system is the basis of mathematics. Students continue to develop their understanding of the relationship between fractions and decimals. They extend the number system to include negative numbers. They also relate percentages to fractions and decimals and begin learning how to use ratios. They find multiples and factors of whole numbers, using the multiples and factors to solve problems involving fractions.

Standard 2 — Computation

Fluency in computation is essential. Students add, subtract, multiply, and divide fractions, decimals, and both positive and negative integers. They solve problems using ratios, proportions, and percentages, including calculating discount and interest. They use mental arithmetic to add or subtract simple fractions and decimals.

Standard 3 — Algebra and Functions

Algebra is a language of patterns, rules, and symbols. Students at this level write and solve simple equations and inequalities, and write and use formulas to solve problems. They use parentheses in more complex expressions to show the order of operations. They also extend graphs of straight lines to include negative values.

Standard 4 — Geometry

Students learn about geometric shapes and develop a sense of space. They draw special types of angles and use them to solve problems. They find and use the sum of the angles of a triangle and of a quadrilateral. They identify shapes that are similar (the same shape but not necessarily the same size). They draw reflections and translations of shapes, and they also draw two-dimensional views of three-dimensional shapes.

Standard 5 — Measurement

The study of measurement is essential because of its uses in many aspects of everyday life. Students measure in order to compare lengths, areas, volumes, weights, times, temperatures, etc. They learn about the number π and use it to calculate the circumference and area of circles. They construct models, find the volume and surface area of prisms and cylinders, and they convert temperatures between Celsius and Fahrenheit.

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Standard 6 — Data Analysis and Probability

Data are all around us — in newspapers and magazines, in television news and commercials, in quality control for manufacturing — and students need to learn how to understand data. At this level, they learn how to display data in frequency tables and in stem-and-leaf plots. They compare the mean, median, and mode. They find probabilities for compound events and write them as fractions, decimals, and percentages. They also estimate the probabilities of future events.

Standard 7 — Problem Solving

In a general sense, mathematics is problem solving. In all mathematics, students use problem-solving skills: they choose how to approach a problem, they explain their reasoning, and they check their results. As they develop their skills with negative numbers, calculating angles, or finding areas, for example, students move from simple to more complex ideas by taking logical steps that build a better understanding of mathematics.

As part of their instruction and assessment, students should also develop the following learning skills by Grade 12 that are woven throughout the mathematics Standards:

Communication

The ability to read, write, listen, ask questions, think, and communicate about math will develop and deepen students' understanding of mathematical concepts. Students should read text, data, tables, and graphs with comprehension and understanding. Their writing should be detailed and coherent, and they should use correct mathematical vocabulary. Students should write to explain answers, justify mathematical reasoning, and describe problem-solving strategies.

Reasoning and Proof

Mathematics is developed by using known ideas and concepts to develop others. Repeated addition becomes multiplication. Multiplication of numbers less than ten can be extended to numbers less than one hundred and then to the entire number system. Knowing how to find the area of a right triangle extends to all right triangles. Extending patterns, finding even numbers, developing formulas, and proving the Pythagorean Theorem are all examples of mathematical reasoning. Students should learn to observe, generalize, make assumptions from known information, and test their assumptions.

Representation

The language of mathematics is expressed in words, symbols, formulas, equations, graphs, and data displays. The concept of one-fourth may be described as a quarter, $\frac{1}{4}$, one divided by four, 0.25, $\frac{1}{3} + \frac{1}{8}$, 25 percent, or an appropriately shaded portion of a pie graph. Higher-level mathematics involves the use of more powerful representations: exponents, logarithms, π, unknowns, statistical representation, algebraic and geometric expressions. Mathematical operations are expressed as representations: $+$, $=$, divide, square. Representations are dynamic tools for solving problems and communicating and expressing mathematical ideas and concepts.

Connections

Connecting mathematical concepts includes linking new ideas to related ideas learned previously, helping students to see mathematics as a unified body of knowledge whose concepts build upon each other. Major emphasis should be given to ideas and concepts across mathematical content areas that help students see that mathematics is a web of closely connected ideas (algebra, geometry, the entire number system). Mathematics is also the common language of many other disciplines (science, technology, finance, social science, geography) and students should learn mathematical concepts used in those disciplines. Finally, students should connect their mathematical learning to appropriate real-world contexts.

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Standard 1

Number Sense

Students compare and order positive and negative integers, decimals, fractions, and mixed numbers. They find multiples* and factors*.*

6.1.1 Understand and apply the basic concept of negative numbers (e.g., on a number line, in counting, in temperature, in "owing").

Example: The temperature this morning was -6° and now it is 3°. How much has the temperature risen? Explain your answer.

6.1.2 Interpret the absolute value of a number as the distance from zero on a number line, and find the absolute value of real numbers.

Example: Use a number line to explain the absolute values of -3 and of 7.

6.1.3 Compare and represent on a number line positive and negative integers, fractions, decimals (to hundredths), and mixed numbers.

Example: Find the positions on a number line of 3.56, -2.5, $1\frac{5}{6}$, and -4.

6.1.4 Convert between any two representations of numbers (fractions, decimals, and percents) without the use of a calculator.

Example: Write $\frac{5}{8}$ as a decimal and as a percent.

6.1.5 Recognize decimal equivalents for commonly used fractions without the use of a calculator.

Example: Know that $\frac{1}{3} = 0.333\ldots$, $\frac{1}{2} = 0.5$, $\frac{2}{5} = 0.4$, etc.

6.1.6 Use models to represent ratios.

Example: Divide 27 pencils to represent the ratio 4:5.

6.1.7 Find the least common multiple* and the greatest common factor* of whole numbers. Use them to solve problems with fractions (e.g., to find a common denominator to add two fractions or to find the reduced form for a fraction).

Example: Find the smallest number that both 12 and 18 divide into. How does this help you add the fractions $\frac{5}{12}$ and $\frac{7}{18}$?

* positive and negative integers: ..., -3, -2, -1, 0, 1, 2, 3, ...

* multiples: e.g., multiples of 7 are 7, 14, 21, 28, etc.

* factors: e.g., factors of 12 are 1, 2, 3, 4, 6, 12

* least common multiple: e.g., least common multiple of 4 and 6 is 12

* greatest common factor: e.g., greatest common factor of 18 and 42 is 6

Standard 2

Computation

Students solve problems involving addition, subtraction, multiplication, and division of integers. They solve problems involving fractions, decimals, ratios, proportions, and percentages.

6.2.1 Add and subtract positive and negative integers.

Example: $17 + -4 = ?, -8 - 5 = ?$

6.2.2 Multiply and divide positive and negative integers.

Example: Continue the pattern: $3 \times 2 = ?, 2 \times 2 = ?, 1 \times 2 = ?, 0 \times 2 = ?, -1 \times 2 = ?, -2 \times 2 = ?$, etc.

6.2.3 Multiply and divide decimals.

Example: $3.265 \times 0.96 = ?, 56.79 \div 2.4 = ?$

6.2.4 Explain how to multiply and divide positive fractions and perform the calculations.

Example: Explain why $\frac{5}{8} \div \frac{15}{16} = \frac{5}{8} \times \frac{16}{15} = \frac{2}{3}$.

6.2.5 Solve problems involving addition, subtraction, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation.

Example: You want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door $27\frac{1}{2}$ inches wide. How far from each edge should you place the bar? Explain your method.

6.2.6 Interpret and use ratios to show the relative sizes of two quantities. Use the notations: a/b, a to b, $a:b$.

Example: A car moving at a constant speed travels 130 miles in 2 hours. Write the ratio of distance to time and use it to find how far the car will travel in 5 hours.

6.2.7 Understand proportions and use them to solve problems.

Example: Sam made 8 out of 24 free throws. Use a proportion to show how many free throws Sam would probably make out of 60 attempts.

6.2.8 Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips.

Example: In a sale, everything is reduced by 20%. Find the sale price of a shirt whose pre-sale price was $30.

6.2.9 Use estimation to decide whether answers are reasonable in decimal problems.

Example: Your friend says that $56.79 \div 2.4 = 2.36625$. Without solving, explain why you think the answer is wrong.

6.2.10 Use mental arithmetic to add or subtract simple fractions and decimals.

Example: Subtract $\frac{1}{6}$ from $\frac{1}{2}$ without using pencil and paper.

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Standard 3

Algebra and Functions

Students write verbal expressions and sentences as algebraic expressions and equations. They evaluate algebraic expressions, solve simple linear equations, and graph and interpret their results. They investigate geometric relationships and describe them algebraically.

6.3.1 Write and solve one-step linear equations and inequalities in one variable and check the answers.

Example: The area of a rectangle is 143 cm^2 and the length is 11 cm. Write an equation to find the width of the rectangle and use it to solve the problem. Describe how you will check to be sure that your answer is correct.

6.3.2 Write and use formulas with up to three variables to solve problems.

Example: You have P dollars in a bank that gives $r\%$ simple interest per year. Write a formula for the amount of interest you will receive in one year. Use the formula to find the amount of interest on \$80 at 6% per year.

6.3.3 Interpret and evaluate mathematical expressions that use grouping symbols such as parentheses.

Example: Find the values of $10 - (7 - 3)$ and of $(10 - 7) - 3$.

6.3.4 Use parentheses to indicate which operation to perform first when writing expressions containing more than two terms and different operations.

Example: Write in symbols: add 19 and 34 and double the result.

6.3.5 Use variables in expressions describing geometric quantities.

Example: Let l, w, and P be the length, width, and perimeter of a rectangle. Write a formula for the perimeter in terms of the length and width.

6.3.6 Apply the correct order of operations and the properties of real numbers (e.g., identity, inverse, commutative*, associative*, and distributive* properties) to evaluate numerical expressions. Justify each step in the process.

Example: Simplify $3(4 - 1) + 2$. Explain your method.

6.3.7 Identify and graph ordered pairs in the four quadrants of the coordinate plane.

Example: Plot the points (3, -1), (-6, 2) and (9, -3). What do you notice?

6.3.8 Solve problems involving linear functions with integer* values. Write the equation and graph the resulting ordered pairs of integers on a grid.

Example: A plant is 3 cm high the first time you measure it (on Day 0). Each day after that the plant grows by 2 cm. Write an equation connecting the height and the number of the day and draw its graph.

6.3.9 Investigate how a change in one variable relates to a change in a second variable.

Example: In the last example, what do you notice about the shape of the graph?

* commutative: the order when adding or multiplying numbers makes no difference (e.g., $5 + 3 = 3 + 5$), but note that this is not true for subtraction or division

* associative: the grouping when adding or multiplying numbers makes no difference (e.g., in $5 + 3 + 2$, adding 5 and 3 and then adding 2 is the same as 5 added to $3 + 2$), but note that this is not true for subtraction or division

* distributive: e.g., $3(5 + 2) = 3 \times 5 + 3 \times 2$

* integers: ..., -3, -2, -1, 0, 1, 2, 3, ...

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Standard 4

Geometry

Students identify, describe, and classify the properties of plane and solid geometric shapes and the relationships between them.

6.4.1 **Identify and draw vertical*, adjacent*, complementary*, and supplementary* angles and describe these angle relationships.**

Example: Draw two parallel lines with another line across them. Identify all pairs of supplementary angles.

6.4.2 **Use the properties of complementary, supplementary, and vertical angles to solve problems involving an unknown angle. Justify solutions.**

Example: Find the size of the supplement to an angle that measures 122°. Explain how you obtain your answer.

6.4.3 **Draw quadrilaterals* and triangles from given information about them.**

Example: Draw a quadrilateral with equal sides but no right angles.

6.4.4 **Understand that the sum of the interior angles of any triangle is 180° and that the sum of the interior angles of any quadrilateral is 360°. Use this information to solve problems.**

Example: Find the size of the third angle of a triangle with angles of 73° and 49°.

6.4.5 **Identify and draw two-dimensional shapes that are similar*.**

Example: Draw a rectangle similar to a given rectangle, but twice the size.

6.4.6 **Draw the translation (slide) and reflection (flip) of shapes.**

Example: Draw a square and then slide it 3 inches horizontally across your page. Draw the new square in a different color.

6.4.7 **Visualize and draw two-dimensional views of three-dimensional objects made from rectangular solids.**

Example: Draw a picture of an arrangement of rectangular blocks from the top, front, and right-hand side.

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* vertical angles: angles 1 and 3, or 2 and 4
* adjacent angles: angles 1 and 2 or 2 and 3, etc.
* complementary angles: two angles whose sum is 90°
* supplementary angles: two angles whose sum is 180° (angles 1 and 2)

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* quadrilateral: a two-dimensional figure with four sides

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* similar: figures that have the same shape but may not have the same size

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Standard 5

Measurement

Students deepen their understanding of the measurement of plane and solid shapes and use this understanding to solve problems. They calculate with temperature and money, and choose appropriate units of measure in other areas.

6.5.1 Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.

Example: A triangular sheet of metal is about 1 foot across. Describe the units and tools you would use to measure its weight, its angles, and the lengths of its sides.

6.5.2 Understand and use larger units for measuring length by comparing miles to yards and kilometers to meters.

Example: How many meters are in a kilometer?

6.5.3 Understand and use larger units for measuring area by comparing acres and square miles to square yards and square kilometers to square meters.

Example: How many square meters are in a square kilometer?

6.5.4 Understand the concept of the constant π as the ratio of the circumference to the diameter of a circle. Develop and use the formulas for the circumference and area of a circle.

Example: Measure the diameter and circumference of several circular objects. (Use string to find the circumference.) With a calculator, divide each circumference by its diameter. What do you notice about the results?

6.5.5 Know common estimates of π (3.14, $\frac{22}{7}$) and use these values to estimate and calculate the circumference and the area of circles. Compare with actual measurements.

Example: Find the area of a circle of radius 15 cm.

6.5.6 Understand the concept of significant figures and round answers to an appropriate number of significant figures.

Example: You measure the diameter of a circle as 2.47 m and use the approximation 3.14 for π to calculate the circumference. Is it reasonable to give 7.7558 m as your answer? Why or why not?

6.5.7 Construct a cube and rectangular box from two-dimensional patterns and use these patterns to compute the surface area of these objects.

Example: Find the total surface area of a shoe box with length 30 cm, width 15 cm, and height 10 cm.

6.5.8 Use strategies to find the surface area and volume of right prisms* and cylinders using appropriate units.

Example: Find the volume of a cylindrical can 15 cm high and with a diameter of 8 cm.

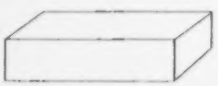
6.5.9 Use a formula to convert temperatures between Celsius and Fahrenheit.

Example: What is the Celsius equivalent of 100°F? Explain your method.

6.5.10 Add, subtract, multiply, and divide with money in decimal notation.

Example: Share $7.25 among five people.

* right prism: a three-dimensional shape with two congruent ends that are polygons and all other faces are rectangles



Mathematics

Standard 6

Data Analysis and Probability

Students compute and analyze statistical measures for data sets. They determine theoretical and experimental probabilities and use them to make predictions about events.

6.6.1 Organize and display single-variable data in appropriate graphs and stem-and-leaf plots*, and explain which types of graphs are appropriate for various data sets.

Example: This stem-and-leaf diagram shows a set of test scores for your class:

Stem	Leaf
6	2 3 7
7	1 5 5 6 8 9
8	0 1 1 2 3 3 5 7 8 8
9	1 2 2 3 3 4

Find your score of 85 in this diagram. Are you closer to the top or the bottom of the class on this test?

6.6.2 Make frequency tables for numerical data, grouping the data in different ways to investigate how different groupings describe the data. Understand and find relative and cumulative frequency for a data set. Use histograms of the data and of the relative frequency distribution, and a broken line graph for cumulative frequency, to interpret the data.

Example: A bag contains pens in three colors. Nine students each draw a pen from the bag without looking, then record the results in the frequency table shown. Complete the column showing relative frequency.

Color	Frequency	Relative Frequency
Red	2	2/9
Green	4	
Purple	3	

6.6.3 Compare the mean*, median*, and mode* for a set of data and explain which measure is most appropriate in a given context.

Example: Twenty students were given a science test and the mean, median and mode were as follows:

mean = 8.5, median = 9, mode = 10.

What does the difference between the mean and the mode suggest about the twenty quiz scores?

6.6.4 Show all possible outcomes for compound events in an organized way and find the theoretical probability of each outcome.

Example: A box contains four cards with the numbers 1 through 4 written on them. Show a list of all the possible outcomes if you draw two cards from the box without looking. What is the theoretical probability that you will draw the numbers one and two? Explain your answer.

6.6.5 Use data to estimate the probability of future events.

Example: Teams A and B have played each other 3 times this season and Team A has won twice. When they play again, what is the probability of Team B winning? How accurate do you think this estimate is?

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6.6.6 Understand and represent probabilities as ratios, measures of relative frequency, decimals between 0 and 1, and percentages between 0 and 100 and verify that the probabilities computed are reasonable.

Example: The weather forecast says that the chance of rain today is 30%. Should you carry an umbrella? Explain your answer.

* stem-and-leaf plot: see diagram in the first example
* mean: the average obtained by adding the values and dividing by the number of values
* median: the value that divides a set of data (written in order of size) into two equal parts
* mode: the most common value in a set of data

Standard 7

Problem Solving

Students make decisions about how to approach problems and communicate their ideas.

6.7.1 Analyze problems by identifying relationships, telling relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.

Example: Solve the problem: "Develop a method for finding all the prime numbers up to 100." Notice that any numbers that 4, 6, 8, ... divide into also divide exactly by 2, and so you do not need to test 4, 6, 8, ...

6.7.2 Make and justify mathematical conjectures based on a general description of a mathematical question or problem.

Example: In the first example, decide that you need to test only the prime numbers as divisors, and explain it in the same way as for 4, 6, 8, ...

6.7.3 Decide when and how to break a problem into simpler parts.

Example: In the first example, decide to find first those numbers not divisible by 2.

Students use strategies, skills, and concepts in finding and communicating solutions to problems.

6.7.4 Apply strategies and results from simpler problems to solve more complex problems.

Example: In the first example, begin by finding all the prime numbers up to 10.

6.7.5 Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.

Example: In the first example, use a hundreds chart to cross off all multiples of 2 (except 2), then all multiples of 3 (except 3), then all multiples of 5 (except 5), etc. Explain why you are doing this.

6.7.6 Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.

Example: Calculate the perimeter of a rectangular field that needs to be fenced. How accurate should you be: to the nearest kilometer, meter, centimeter, or millimeter? Explain your answer.

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6.7.7 **Select and apply appropriate methods for estimating results of rational-number computations.**

Example: Measure the length and height of the walls of a room to find the total area. Estimate an answer by imagining meter squares covering the walls.

6.7.8 **Use graphing to estimate solutions and check the estimates with analytic approaches.**

Example: Use a graphing calculator to estimate the coordinates of the point where the straight line $y = 8x - 3$ crosses the x-axis. Confirm your answer by checking it in the equation.

6.7.9 **Make precise calculations and check the validity of the results in the context of the problem.**

Example: In the first example, check whether some of the numbers not crossed out are in fact primes.

Students determine when a solution is complete and reasonable and move beyond a particular problem by generalizing to other situations.

6.7.10 **Decide whether a solution is reasonable in the context of the original situation.**

Example: In the first example, decide whether your method was a good one — did it find all the prime numbers efficiently?

6.7.11 **Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems.**

Example: Use a hundreds chart to find all the numbers that are multiples of both 2 and 3.

NOTES

Grade 6

Science

Beginning with Grade 6, the Indiana Academic Standards for science contain seven Standards, with the addition of Historical Perspectives. Each Standard is described below. On the pages that follow, age-appropriate concepts are listed underneath each Standard. These ideas build a foundation for understanding the intent of each Standard.

Standard 1 — The Nature of Science and Technology

It is the union of science and technology that forms the scientific endeavor and that makes it so successful. Although each of these human enterprises has a character and history of its own, each is dependent on and reinforces the other. This first Standard draws portraits of science and technology that emphasize their roles in the scientific endeavor and reveal some of the similarities and connections between them. In order for students to truly understand the nature of science and technology, they must model the process of scientific investigation through inquiries, fieldwork, lab work, etc. Through these experiences, students will practice designing investigations and experiments, making observations, and formulating theories based on evidence.

Standard 2 — Scientific Thinking

There are certain thinking skills associated with science, mathematics, and technology that young people need to develop during their school years. These are mostly, but not exclusively, mathematical and logical skills that are essential tools for both formal and informal learning and for a lifetime of participation in society as a whole. Good communication is also essential in order to both receive and disseminate information and to understand others' ideas as well as have one's own ideas understood. Writing, in the form of journals, essays, lab reports, procedural summaries, etc., should be an integral component of students' experiences in science.

Standard 3 — The Physical Setting

One of the grand success stories of science is the unification of the physical universe. It turns out that all natural objects, events, and processes are connected to each other. This Standard contains recommendations for basic knowledge about the overall structure of the universe and the physical principles on which it seems to run, with emphasis on Earth and the solar system. This Standard focuses on two principle subjects: the structure of the universe and the major processes that have shaped planet Earth, and the concepts with which science describes the physical world in general – organized under the headings of *Matter and Energy* and *Forces of Nature*. In Grade 6, students learn some of the relationships between physical objects, events, and processes in the universe.

Standard 4 — The Living Environment

People have long been curious about living things – how many different species there are, what they are like, how they relate to each other, and how they behave. Living organisms are made of the same components as all other matter, involve the same kinds of transformations of energy, and move using the same basic kinds of forces. Thus, all of the physical principles discussed in Standard 3 – The Physical Setting, apply to life as well as to stars, raindrops, and television sets. This Standard offers recommendations on basic knowledge about how living things function and how they interact with one another and their environment. In Grade 6, students learn that plants and animals obtain energy in different ways and contain different structures for obtaining energy.

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Standard 5 — The Mathematical World

Mathematics is essentially a process of thinking that involves building and applying abstract, logically connected networks of ideas. These ideas often arise from the need to solve problems in science, technology, and everyday life — problems ranging from how to model certain aspects of a complex scientific problem to how to balance a checkbook.

Standard 6 — Historical Perspectives

Examples of historical events provide a context for understanding how the scientific enterprise operates. By studying these events, one understands that new ideas are limited by the context in which they are conceived, are often rejected by the scientific establishment, sometimes spring from unexpected findings, and grow or transform slowly through the contributions of many different investigators. The historical events listed in Grade 6 are certainly not the only events that could be used to illustrate this Standard, but they provide an array of examples. Through these examples, students will gain insight into the historical background of the development of the modern science of chemistry.

Standard 7 — Common Themes

Some important themes pervade science, mathematics, and technology, and appear over and over again, whether we are looking at ancient civilization, the human body, or a comet. These ideas transcend disciplinary boundaries and prove fruitful in explanation, in theory, in observation, and in design. A focus on *Constancy and Change* within this Standard provides students opportunities to engage in long-term and on-going laboratory and fieldwork, and thus understand the role of change over time in studying The Physical Setting and The Living Environment.

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Standard 1

The Nature of Science and Technology

Students design investigations. They use computers and other technology to collect and analyze data; they explain findings and can relate how they conduct investigations to how the scientific enterprise functions as a whole. Students understand that technology has allowed humans to do many things, yet it cannot always provide solutions to our needs.

The Scientific View of the World

6.1.1 Explain that some scientific knowledge, such as the length of the year, is very old and yet is still applicable today. Understand, however, that scientific knowledge is never exempt from review and criticism.

Scientific Inquiry

6.1.2 Give examples of different ways scientists investigate natural phenomena and identify processes all scientists use, such as collection of relevant evidence, the use of logical reasoning, and the application of imagination in devising hypotheses* and explanations, in order to make sense of the evidence.

6.1.3 Recognize and explain that hypotheses are valuable, even if they turn out not to be true, if they lead to fruitful investigations.

* hypothesis: an informed guess or tentative explanation for which there is not yet much evidence

The Scientific Enterprise

6.1.4 Give examples of employers who hire scientists, such as colleges and universities, businesses and industries, hospitals, and many government agencies.

6.1.5 Identify places where scientists work, including offices, classrooms, laboratories, farms, factories, and natural field settings ranging from space to the ocean floor.

6.1.6 Explain that computers have become invaluable in science because they speed up and extend people's ability to collect, store, compile, and analyze data; prepare research reports; and share data and ideas with investigators all over the world.

Technology and Science

6.1.7 Explain that technology is essential to science for such purposes as access to outer space and other remote locations, sample collection and treatment, measurement, data collection and storage, computation, and communication of information.

6.1.8 Describe instances showing that technology cannot always provide successful solutions for problems or fulfill every human need.

6.1.9 Explain how technologies can influence all living things.

Standard 2

Scientific Thinking

Students use computers and other tools to collect information, calculate, and analyze data. They prepare tables and graphs, using these to summarize data and identify relationships.

Computation and Estimation

6.2.1 Find the mean* and median* of a set of data.

6.2.2 Use technology, such as calculators or computer spreadsheets, in analysis of data.

* mean: the average obtained by adding the values and dividing by the number of values

* median: the value that divides a set of data, written in order of size, into two equal parts

Manipulation and Observation

6.2.3 Select tools, such as cameras and tape recorders, for capturing information.

6.2.4 Inspect, disassemble, and reassemble simple mechanical devices and describe what the various parts are for. Estimate what the effect of making a change in one part of a system is likely to have on the system as a whole.

Communication Skills

6.2.5 Organize information in simple tables and graphs and identify relationships they reveal. Use tables and graphs as examples of evidence for explanations when writing essays or writing about lab work, fieldwork, etc.

6.2.6 Read simple tables and graphs produced by others and describe in words what they show.

6.2.7 Locate information in reference books, back issues of newspapers and magazines, compact disks, and computer databases.

6.2.8 Analyze and interpret a given set of findings, demonstrating that there may be more than one good way to do so.

Critical Response Skills

6.2.9 Compare consumer products, such as generic and brand-name products, and consider reasonable personal trade-offs among them on the basis of features, performance, durability, and costs.

Standard 3

The Physical Setting

Students collect and organize data to identify relationships between physical objects, events, and processes. They use logical reasoning to question their own ideas as new information challenges their conceptions of the natural world.

The Universe

6.3.1 Compare and contrast the size, composition, and surface features of the planets that comprise the solar system, as well as the objects orbiting them. Explain that the planets, except Pluto, move around the sun in nearly circular orbits.

6.3.2 Observe and describe that planets change their position relative to the background of stars.

6.3.3 Explain that Earth is one of several planets that orbit the sun, and that the moon, as well as many artificial satellites and debris, orbit around Earth.

The Earth and the Processes That Shape It

6.3.4 Explain that we live on a planet which appears at present to be the only body in the solar system capable of supporting life.

6.3.5 Use models or drawings to explain that Earth has different seasons and weather patterns because it turns daily on an axis that is tilted relative to the plane of Earth's yearly orbit around the sun. Know that because of this, sunlight falls more intensely on different parts of Earth during the year (the accompanying greater length of days also has an effect) and the difference in heating produces seasons and weather patterns.

6.3.6 Use models or drawings to explain that the phases of the moon are caused by the moon's orbit around Earth, once in about 28 days, changing what part of the moon is lighted by the sun and how much of that part can be seen from Earth, both during the day and night.

6.3.7 Understand and describe the scales involved in characterizing Earth and its atmosphere. Describe that Earth is mostly rock, that three-fourths of its surface is covered by a relatively thin layer of water, and that the entire planet is surrounded by a relatively thin blanket of air.

6.3.8 Explain that fresh water, limited in supply and uneven in distribution, is essential for life and also for most industrial processes. Understand that this resource can be depleted or polluted, making it unavailable or unsuitable for life.

6.3.9 Illustrate that the cycling of water in and out of the atmosphere plays an important role in determining climatic patterns.

6.3.10 Describe the motions of ocean waters, such as tides, and identify their causes.

6.3.11 Identify and explain the effects of oceans on climate.

6.3.12 Describe ways human beings protect themselves from adverse weather conditions.

6.3.13 Identify, explain, and discuss some effects human activities, such as the creation of pollution, have on weather and the atmosphere.

6.3.14 Give examples of some minerals that are very rare and some that exist in great quantities. Explain how recycling and the development of substitutes can reduce the rate of depletion of minerals.

6.3.15 Explain that although weathered* rock is the basic component of soil, the composition and texture of soil and its fertility and resistance to erosion* are greatly influenced by plant roots and debris, bacteria, fungi, worms, insects, and other organisms.

6.3.16 Explain that human activities, such as reducing the amount of forest cover, increasing the amount and variety of chemicals released into the atmosphere, and farming intensively, have changed the capacity of the environment to support some life forms.

* weathering: breaking down of rocks and other materials on Earth's surface by such processes as rain or wind

* erosion: the process by which the products of weathering are moved from one place to another

Matter* and Energy*

6.3.17 Recognize and describe that energy is a property of many objects and is associated with heat, light, electricity, mechanical motion, and sound.

6.3.18 Investigate and describe that when a new material, such as concrete, is made by combining two or more materials, it has properties that are different from the original materials.

6.3.19 Investigate that materials may be composed of parts that are too small to be seen without magnification.

6.3.20 Investigate that equal volumes* of different substances usually have different masses as well as different densities*.

* matter: anything that has mass* and takes up space

* mass: a measure of how much matter is in an object

* energy: what is needed to do work*

* work: a force* acting over a distance to move an object

* force: a push or a pull that can cause a change in the motion* of an object

* motion: a change in position of an object in a certain amount of time

* volume: a measure of the size of a three-dimensional object

* density: the density of a sample is the sample's mass divided by its volume

Forces of Nature

6.3.21 Investigate, using a prism for example, that light is made up of a mixture of many different colors of light, even though the light is perceived as almost white.

6.3.22 Demonstrate that vibrations in materials set up wavelike disturbances, such as sound and earthquake waves*, that spread away from the source.

6.3.23 Explain that electrical circuits* provide a means of transferring electrical energy from sources such as generators to devices in which heat, light, sound, and chemical changes are produced.

* wave: traveling disturbance that carries energy from one place to another

* circuit: the complete path of an electric current

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Standard 4

The Living Environment

Students recognize that plants and animals obtain energy in different ways, and they can describe some of the internal structures of organisms related to this function. They examine the similarities and differences between humans and other species. They use microscopes to observe cells and recognize cells as the building blocks of all life.*

Diversity of Life

6.4.1 Explain that one of the most general distinctions among organisms is between green plants, which use sunlight to make their own food, and animals, which consume energy-rich foods.

6.4.2 Give examples of organisms that cannot be neatly classified as either plants or animals, such as fungi and bacteria.

6.4.3 Describe some of the great variety of body plans and internal structures animals and plants have that contribute to their being able to make or find food and reproduce.

6.4.4 Recognize and describe that a species comprises all organisms that can mate with one another to produce fertile offspring.

6.4.5 Investigate and explain that all living things are composed of cells whose details are usually visible only through a microscope.

6.4.6 Distinguish the main differences between plant and animal cells, such as the presence of chlorophyll* and cell walls in plant cells and their absence in animal cells.

6.4.7 Explain that about two-thirds of the mass of a cell is accounted for by water. Understand that water gives cells many of their properties.

* species: a category of biological classification that is comprised of organisms sufficiently and closely related as to be potentially able to mate with one another

* chlorophyll: a substance found in green plants that is needed for photosynthesis*

* photosynthesis: a process by which green plants use energy from sunlight to make their own food

Interdependence of Life and Evolution

6.4.8 Explain that in all environments, such as freshwater, marine, forest, desert, grassland, mountain, and others, organisms with similar needs may compete with one another for resources, including food, space, water, air, and shelter. Note that in any environment, the growth and survival of organisms depend on the physical conditions.

6.4.9 Recognize and explain that two types of organisms may interact in a competitive or cooperative relationship, such as producer*/consumer*, predator*/prey*, or parasite*/host*.

6.4.10 Describe how life on Earth depends on energy from the sun.

* producer: an organism that can make its own food

* consumer: an organism that feeds directly or indirectly on producers

* predator: an organism that kills and eats other organisms

* prey: an organism that is killed and eaten by a predator

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* parasite: an organism that feeds on other living organisms

* host: an organism in which or on which another organism lives

Human Identity

6.4.11 Describe that human beings have body systems for obtaining and providing energy, defense, reproduction, and the coordination of body functions.

6.4.12 Explain that human beings have many similarities and differences and that the similarities make it possible for human beings to reproduce and to donate blood and organs to one another.

6.4.13 Give examples of how human beings use technology to match or exceed many of the abilities of other species.

Standard 5

The Mathematical World

Students apply mathematics in scientific contexts. They use mathematical ideas, such as relations between operations, symbols, shapes in three dimensions, statistical relationships, and the use of logical reasoning in the representation and synthesis of data.

Numbers

6.5.1 Demonstrate that the operations addition and subtraction are inverses and that multiplication and division are inverses of each other.

6.5.2 Evaluate the precision and usefulness of data based on measurements taken.

Shapes and Symbolic Relationships

6.5.3 Explain why shapes on a sphere* like Earth cannot be depicted on a flat surface without some distortion.

6.5.4 Demonstrate how graphs may help to show patterns, such as trends, varying rates of change, gaps, or clusters, which can be used to make predictions.

* sphere: a shape best described as that of a round ball, such as a baseball, that looks the same when seen from all directions

Reasoning and Uncertainty

6.5.5 Explain the strengths and weaknesses of using an analogy to help describe an event, object, etc.

6.5.6 Predict the frequency of the occurrence of future events based on data.

6.5.7 Demonstrate how probabilities and ratios can be expressed as fractions, percentages, or odds.

Standard 6

Historical Perspectives

Students gain understanding of how the scientific enterprise operates through examples of historical events. Through the study of these events, they understand that new ideas are limited by the context in which they are conceived, are often rejected by the scientific establishment, sometimes spring from unexpected findings, and grow or transform slowly through the contributions of many different investigators.

6.6.1 Understand and explain that from the earliest times until now, people have believed that even though countless different kinds of materials seem to exist in the world, most things can be made up of combinations of just a few basic kinds of things. Note that there has not always been agreement, however, on what those basic kinds of things are, such as the theory of long ago that the basic substances were earth, water, air, and fire. Understand that this theory seemed to explain many observations about the world, but as we know now, it fails to explain many others.

6.6.2 Understand and describe that scientists are still working out the details of what the basic kinds of matter are on the smallest scale, and of how they combine, or can be made to combine, to make other substances.

6.6.3 Understand and explain that the experimental and theoretical work done by French scientist Antoine Lavoisier in the decade between the American and French Revolutions contributed crucially to the modern science of chemistry.

Standard 7

Common Themes

Students use mental and physical models to conceptualize processes. They recognize that many systems have feedback mechanisms that limit changes.

Systems

6.7.1 Describe that a system, such as the human body, is composed of subsystems.

Models and Scale

6.7.2 Use models to illustrate processes that happen too slowly, too quickly, or on too small a scale to observe directly, or are too vast to be changed deliberately, or are potentially dangerous.

Constancy and Change

6.7.3 Identify examples of feedback mechanisms within systems that serve to keep changes within specified limits.

Grade 6

Social Studies

Peoples, Places, and Cultures in Europe and the Americas

Students in Grade 6 study the regions and countries of Europe and the Americas, including geographical, historical, economic, political, and cultural relationships. The areas emphasized are Europe and North and South America, including Central America and the Caribbean.

The K – 8 Indiana Academic Standards for social studies are organized around five content areas. The content area Standards and the types of learning experiences they provide to students in Grade 6 are described below. On the pages that follow, age-appropriate concepts are listed underneath each Standard. Skills for thinking, inquiry, and participation in a democratic society are integrated throughout. Specific terms are defined and examples are provided when necessary.

Standard 1 — History

Students will examine the key historic movements, events, and figures that contributed to the development of the modern European and American nations from early civilizations to early modern times.

Standard 2 — Civics and Government

Students will compare and contrast forms of government in different historical periods with contemporary political structures of Europe and the Americas and examine the rights and responsibilities of individuals in different political systems.

Standard 3 — Geography

Students will identify the characteristics of climate regions in Europe and the Americas and describe major physical features, countries, and cities of Europe and the Western Hemisphere.

Standard 4 — Economics

Students will examine the influence of physical and cultural factors upon the economic systems of countries in Europe and the Americas.

Standard 5 — Individuals, Society, and Culture

Students will examine the role of individuals and groups in societies of Europe and the Americas, identify connections among cultures, and trace the influence of cultures of the past on present societies. They will also analyze patterns of change, including the impact of scientific and technological innovations, and examine the role of artistic expression in selected cultures of Europe and the Americas.

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Standard 1

History

Students will examine the key historic movements, events, and figures that contributed to the development of the modern European and American nations from early civilizations to early modern times.

Historical Knowledge

6.1.1 Describe the development of ancient Aegean civilizations, and the Greek city-based republics, including the cultural achievements of Athens.

6.1.2 Trace the major developments and achievements of the Roman republic and the rise and expansion of the Roman Empire.

6.1.3 Describe the migration of Jews and the spread of Christianity and the Roman Catholic Church in Western Europe during the Roman Empire.

6.1.4 Analyze the reasons for the decline and fall of the Roman Empire.

6.1.5 Explain the continuation and contributions of the eastern Roman Empire, referred to as the Byzantine Empire, after the fall of Rome, including its influence on the spread of Christianity in Russia and Eastern Europe.

6.1.6 Describe medieval society, and explain the political, social, and economic organization provided by the feudal system.

6.1.7 Analyze the diverse points of view and interests of those involved in the Crusades and give examples of the changes brought about by the Crusades.

Example: The expansion of trade routes, increased contact between European and non-European peoples, changes in technology, and centralization of political and military power.

6.1.8 Explain the effects of the Black Death, or bubonic plague, along with economic, environmental, and social factors that led to the decline of medieval monarchies.

6.1.9 Examine the importance of Asian trade routes and trace the rise of cultural centers and trading cities, such as Florence and Venice.

6.1.10 Recognize the diverse perspectives, ideas, interests, and personalities that brought about the Renaissance in Europe.

Example: Ideas – the importance of the individual; scientific inquiry based on observation and experimentation; interest in Greek and Roman thought; and new approaches in the fine arts and literature.
Personalities – Leonardo da Vinci, Michelangelo, Nicholas Copernicus, William Shakespeare, and Galileo Galilei.

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6.1.11 Analyze the interconnections of people, places, and events in the economic, scientific, and cultural exchanges that led to the European Renaissance and voyages of discovery.

6.1.12 Describe the development of Spain during and after the defeat of the Muslims and the completion of the "re-conquest" in 1492.

6.1.13 Describe the development of Mesoamerican* civilizations, such as the Mayas, Toltecs, and Aztecs in Mexico and the Incas in South America, prior to contact with Europeans.

Example: Agricultural, scientific, and artistic achievements.

6.1.14 Examine the causes and outcomes of the defeat of the Aztec and Incan empires by the Spanish.

6.1.15 Compare Spanish colonies in Mexico and South America with French and British colonies in Canada.

* Mesoamerica: the area of Mexico and Central America where early civilizations were located

Chronological Thinking, Comprehension, Analysis, and Interpretation

6.1.16 Develop and compare timelines that identify major people, events, and developments in the history of individual civilizations and/or countries that comprise Europe and the Americas.

6.1.17 Use the terms "decade," "century," and "millennium," and compare alternative ways that historical periods and eras are designated by identifying the organizing principles upon which each is based.

6.1.18 Recognize historical perspectives in fiction and non-fiction stories by identifying the historical context in which events unfolded and by avoiding evaluation of the past solely in terms of present-day norms.

Example: Read accounts of the travels of Marco Polo considering perspectives on the geography of the world during his time.

6.1.19 Analyze cause-and-effect relationships, keeping in mind multiple causation, including the importance of individuals, ideas, human interests, beliefs, and chance in history.

6.1.20 Differentiate between factual and fictional historical accounts; explain the meaning of historical passages by identifying who was involved, what happened, where it happened, what events led to these developments, and what consequences or outcomes followed.

Research Capabilities

6.1.21 Form research questions, and use a variety of information resources* to obtain, evaluate, and present historical data on the people, places, events, and developments in the history of Europe and the Americas.

Example: Collect data and develop maps, graphs, or spread sheets showing the impact of the Black Death on the population of Europe.

* information resources: print media, including books, magazines, and newspapers, electronic media, such as radio, television, Web sites, and databases, and community resources, such as individuals and organizations

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Standard 2

Civics and Government

Students will compare and contrast forms of government in different historical periods with contemporary political structures of Europe and the Americas and examine the rights and responsibilities of individuals in different political systems.

Foundations of Government

6.2.1 Compare the characteristics of different types of government developed by ancient European civilizations, such as the Greek democracies, the Roman Republic, and the Roman Empire, and compare these to governments today.

6.2.2 Examine key ideas of the Magna Carta (1215), the Petition of Right (1628), and the English Bill of Rights (1689) as documents to place limits on the English monarchy.

6.2.3 Define the term nation-state*, and describe the rise of nation-states headed by monarchs in Europe from 1500 to 1700.

* nation-state: a political entity that claims the right to rule over a defined territory and jurisdiction over everyone within it

Functions of Government

6.2.4 Identify major forms of government in Europe and the Americas, and compare them with that of the United States.

Example: Compare the constitutional government of the United States with that of Canada or the United Kingdom; compare constitutional democracies with non-democracies, such as the Soviet Union in the past and Cuba in the present.

6.2.5 Describe the governmental institution of the European Union (EU) and its relationship to the sovereign governments of particular members of the EU.

Roles of Citizens

6.2.6 Define citizenship and roles of citizens in selected nation-states of Europe and the Americas, and make comparisons to the United States.

Example: Examine the roles of citizens in voting and participating in political parties and voluntary organizations of civil society.

International Relations

6.2.7 Identify the functions of governmental international organizations in the world today.

Example: Examine the functions of the Organization of American States (OAS), the World Court, North Atlantic Treaty Organization (NATO), and the United Nations.

6.2.8 Analyze the impact of the concept of democracy on nations of Europe and the Americas.

Example: Explain the development of European democracies and political change toward democracy in South America.

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6.2.9 Use data gathered from a variety of information resources* to compare different forms of government in Europe and the Americas.

* information resources: print media, including books, magazines, and newspapers; electronic media, such as radio, television, Web sites, and databases; and community resources, such as individuals and organizations

Standard 3

Geography

Students will identify the characteristics of climate regions in Europe and the Americas and describe major physical features, countries and cities of Europe and the Western Hemisphere.

The World in Spatial Terms

6.3.1 Explain the components of most maps (title, scale, legend, grid, and projection). Compare different map types (topographic, thematic, etc.) and different map projections, and explain the appropriate use for each.

6.3.2 Use latitude and longitude to locate places on Earth and describe the uses of locational technology, such as Global Positioning Systems (GPS)* and Geographic Information Systems (GIS)*.

* Global Positioning Systems (GPS): a system of satellites and ground stations used to locate precise points on the surface of Earth

* Geographic Information Systems (GIS): information technology systems used to store, analyze, manipulate, and display a wide range of geographic information

Places and Regions

6.3.3 Identify the names and locations of countries and major cities in Europe and the Western Hemisphere. Identify the states of Mexico and the provinces of Canada.

6.3.4 Describe major physical characteristics* of regions in Europe and the Americas.

6.3.5 Describe major cultural characteristics* of regions in Europe and the Western Hemisphere.

* physical characteristics: natural features, such as land forms, water forms, climate, natural vegetation, and native wildlife

* cultural characteristics: human features, such as population characteristics, communication and transportation networks, religion and customs, how people make a living or build homes and other structures

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Physical Systems

6.3.6 Explain how Earth /sun relationships*, ocean currents, and winds influence climate differences on Earth.

6.3.7 Locate and map the climate regions of Europe and the Western Hemisphere. Describe the characteristics of each, and explain how they differ.

6.3.8 Identify major biomes*, and explain ways in which the natural environment of places in Europe and the Americas relates to their climate, which is influenced by Earth /sun relationships.

* Earth/sun relationships: the rotation and tilt of Earth on its axis and the rotation of Earth around the sun

* biomes: major ecological communities, such as rainforest, desert, grassland

Human Systems

6.3.9 Identify patterns of population distribution and growth in Europe and the Americas, and explain changes in these patterns, which have occurred over time.

6.3.10 Compare and contrast cultural patterns, such as language, religion, and ethnicity, in various parts of Europe, the Caribbean, and North, South, and Central America.

6.3.11 Research the reasons for the locations of the major manufacturing and agricultural regions of Europe and the Americas, using a variety of information resources*.

* information resources: print media, including books, magazines, and newspapers, electronic media, such as radio, television, Web sites, and databases; and community resources, such as individuals and organizations

Environment and Society

6.3.12 Analyze the distribution of natural resources in Europe and the Western Hemisphere.

6.3.13 Analyze and give examples of the consequences of human impact on the physical environment, and evaluate ways in which technology influences human capacity to modify the physical environment.

6.3.14 Give examples of how both natural and technological hazards have impacted the physical environment and human populations in specific areas of Europe and the Americas.

Uses of Geography

6.3.15 Give examples of how land and water forms, climate, and natural vegetation have influenced historical trends and developments in Europe and the Western Hemisphere.

6.3.16 Identify environmental issues that affect Europe and the Americas. Examine contrasting perspectives on these problems, and explain how human-induced changes in the physical environment in one place cause changes in another place.

Example: Acid rain, air and water pollution, deforestation

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Standard 4

Economics

Students will examine the influence of physical and cultural factors upon the economic systems of countries in Europe and the Americas.

6.4.1 Give examples of how trade related to key developments in the history of Europe and the Americas.

Example: The growth of trading towns and cities in medieval Europe led to money economies. Competition to expand world trade led to European voyages of trade and exploration.

6.4.2 Analyze how countries of Europe and the Americas have benefited from trade in different historical periods.

Example: Increased production and consumption, lower prices.

6.4.3 Explain why international trade requires a system for exchanging currency between nations, and provide examples of currencies from Europe and the Americas.

6.4.4 Define types of trade barriers*.

6.4.5 Describe how different economic systems* (traditional*, command*, market*, mixed*) in Europe and the Americas answer the basic economic questions on what to produce, how to produce, and for whom to produce.

6.4.6 Explain how financial institutions (banks, credit unions, stocks-and-bonds markets) channel funds from savers to borrowers and investors.

6.4.7 Compare the standard of living of various countries of Europe and the Americas today using Gross Domestic Product* (GDP) per capita as an indicator.

6.4.8 Analyze current economic issues in the countries of Europe or the Americas using a variety of information resources*.

Example: Use information search methods and the Internet to examine changes in energy prices and consumption.

6.4.9 Identify economic connections between the local community and the countries of Europe or the Americas, and identify job skills needed to be successful in the workplace.

6.4.10 Identify situations in which the actions of consumers and producers in Europe or the Americas help or harm other individuals who are not directly involved in the consumption or production of a product.

6.4.11 Give reasons why saving and investment are important to the economies of the United States and other countries, and compare and contrast individual saving and investment options.

Example: Savings accounts, certificates of deposit, and stocks.

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* trade barriers: things that hinder trade, such as tariffs, quotas, or embargos
* economic systems: ways that people allocate economic resources, goods, and services
* traditional economy: resources are allocated based on custom and tradition
* command economy: resources are allocated by the government or other central authority
* market economy: resources are allocated by individuals
* mixed economy: resources are allocated by some combination of traditional, command, or market systems
* Gross Domestic Product (GDP): the value of all final goods and services produced in a country in a year
* information resources: print media, including books, magazines, and newspapers; electronic media, such as radio, television, Web sites, and databases; and community resources, such as individuals and organizations

Standard 5

Individuals, Society, and Culture

Students will examine the role of individuals and groups in societies of Europe and the Americas, identify connections among cultures, and trace the influence of cultures of the past on present societies. They will also analyze patterns of change, including the impact of scientific and technological innovations, and examine the role of artistic expression in selected cultures of Europe and the Americas.

6.5.1 Explain the term socialization*, and compare the way people learn the rules and their roles in the groups to which they belong in different cultures and times.

Example: Compare the different types of schooling that people have received in different times and places, such as in ancient Greece and Rome, in medieval Europe, and early America. Compare schools in specific countries in Europe with those in the United States in the present.

6.5.2 Distinguish between material* and non-material* aspects of culture.

6.5.3 Explain that cultures change in three ways: cultural diffusion*, invention*, and innovation*.

6.5.4 Give examples of how religious beliefs and philosophical ideas have spread from one culture to another among societies of Europe and the Americas.

Example: The spread of Christianity from Europe to the Americas during the colonial period and the exchange of ideas about democratic government between Europe and the Americas in the past and the present are examples of the diffusion of ideas.

6.5.5 Identify examples of inventions and technological innovations that have brought about cultural change in Europe and the Americas, and examine their impact.

Example: Innovations in communications, such as computer technology, help to spread information and ideas very rapidly. One result may be an increase in the rate of cultural change.

6.5.6 Define the terms anthropology* and archeology* and explain how these fields contribute to our understanding of societies in the present and the past.

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6.5.7 Examine art, music, literature, and architecture in Europe and the Americas; explain their relationship to the societies that created them, and give examples of how artistic ideas have spread from one culture to another.

6.5.8 Use a variety of resources, including newspapers, magazines, Web sites, and databases, to collect and analyze data on cultural factors in countries of Europe and the Americas. Use charts, graphs, and other data to compare and hypothesize the relation of these factors to a nation's development.

6.5.9 Examine artifacts*, including documents*, from other cultures to determine their use and significance.

Example: A seashell is a natural object, but a seashell that has been made into a necklace is an artifact.

* socialization: the process through which people learn the rules of society
* material culture: the things that a society makes or uses, such as clothing, shelter, food, tools, and other things needed for both survival and enjoyment
* non-material culture: behavior, such as customs, traditions, beliefs, values, interactions among people, and ways of going about daily activities
* cultural diffusion: the spread of ideas from one culture to another
* invention: a new idea about how something can be made or done
* innovation: an improvement in a culture's technology
* anthropology: the study of human beings, there are four major fields of anthropology: cultural anthropology, forensic anthropology, linguistics, and archeology
* archeology: a branch of anthropology, which studies past cultures through the things that remain, such as buildings, tools, or pottery
* artifact: any object made or modified for use by human beings
* document: a two-dimensional artifact, such as a letter, chart, map, photograph, painting, or drawing

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NOTES

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